CI/HUMINT Demonstration

22 Oct 2003

AGENDA

Model Overview
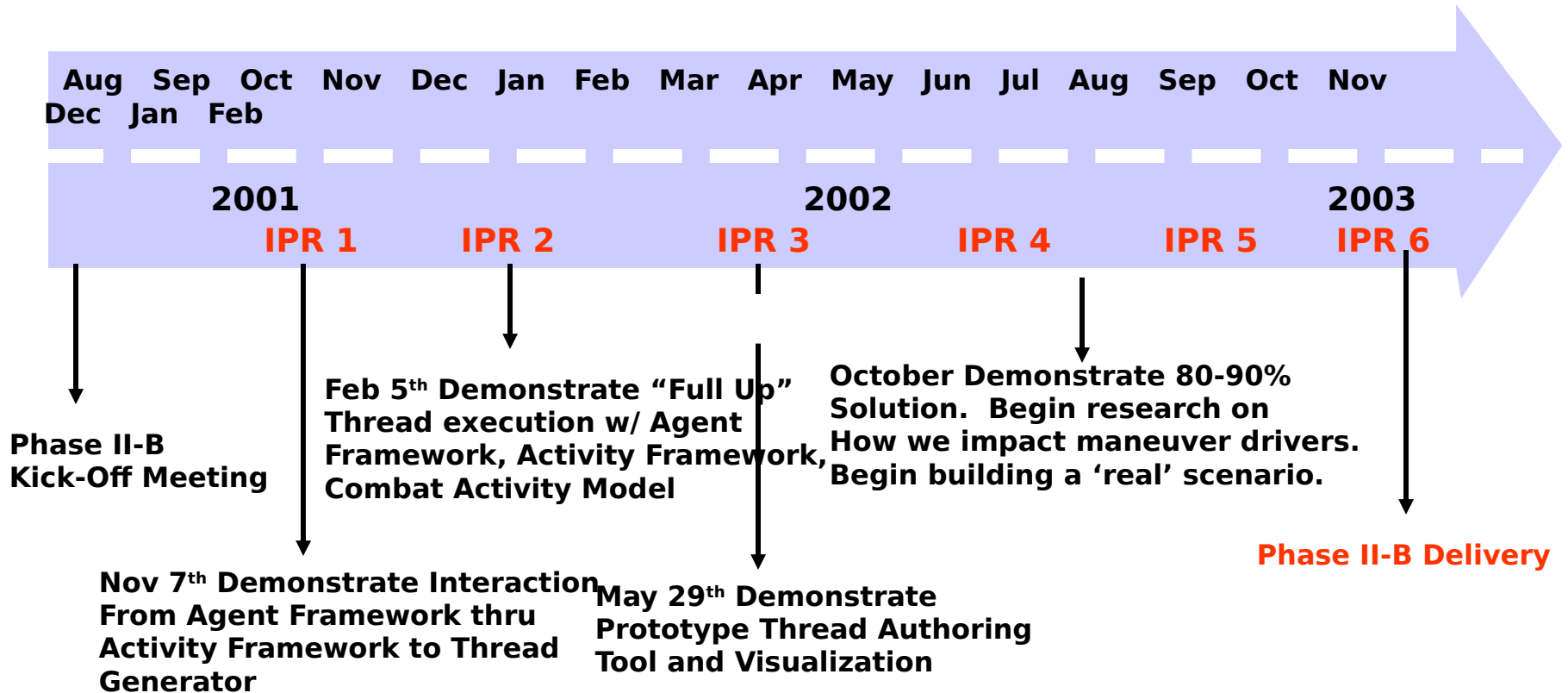
Model Details

Demonstration

Future Plans/Ideas

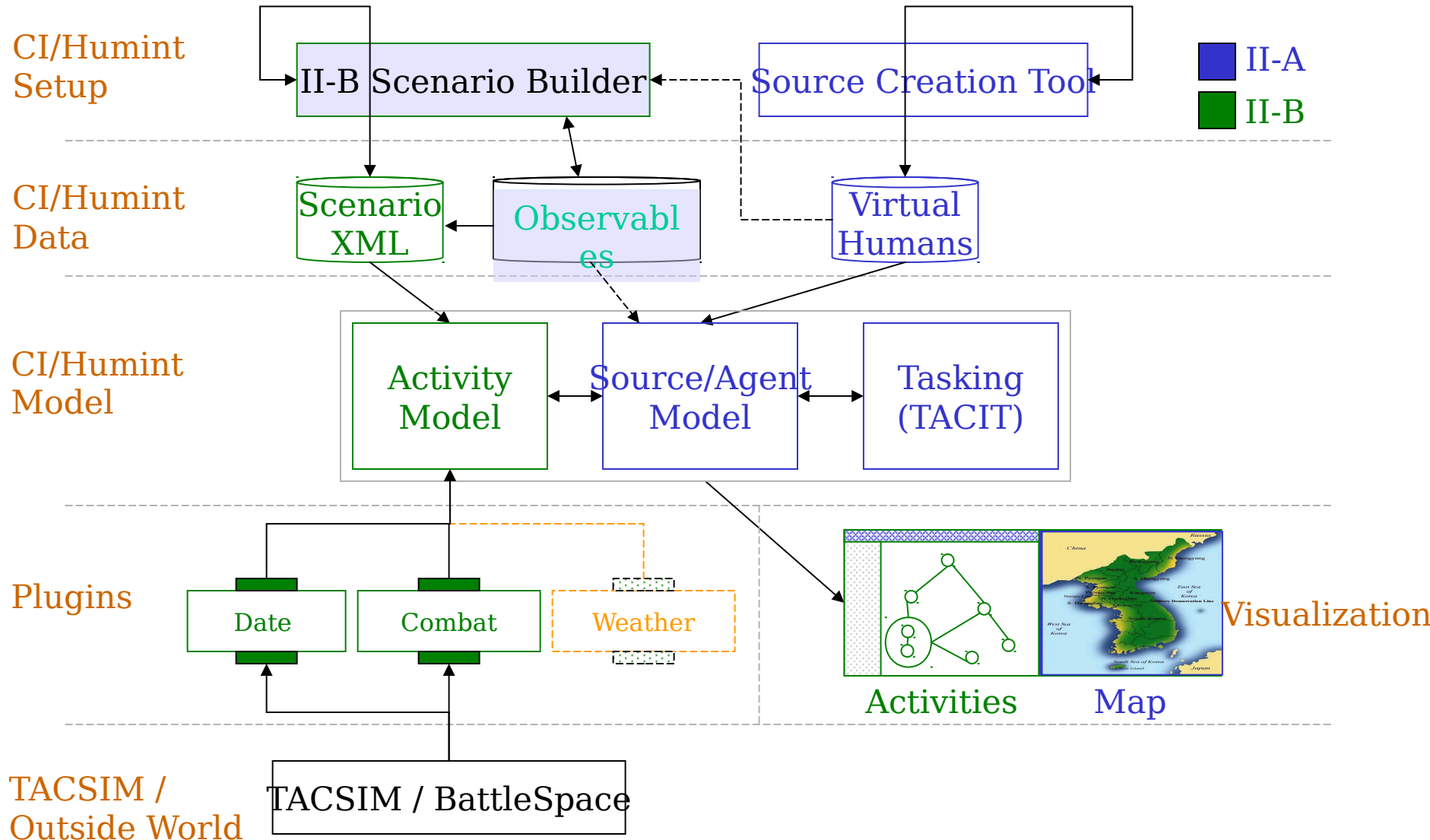Discussion

PHASE II-B ROADMAP

Aug Sep Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov
Dec Jan Feb

2001   **2002**   **2003**

IPR 1   **IPR 2**   **IPR 3**   **IPR 4**   **IPR 5**   **IPR 6**

Feb 5th Demonstrate "Full Up"
Thread execution w/ Agent
Framework, Activity Framework,
Combat Activity Model

October Demonstrate 80-90%
Solution. Begin research on
How we impact maneuver drivers.
Begin building a 'real' scenario.

Phase II-B
Kick-Off Meeting

Phase II-B Delivery

Nov 7th Demonstrate Interaction
From Agent Framework thru
Activity Framework to Thread
Generator

May 29th Demonstrate
Prototype Thread Authoring
Tool and Visualization

PHASE II-A Capabilities

- Enemy Prisoners of War
    - Triggered by reduction in unit strength
    - Screening report
    - Evacuation to interrogation facility
    - Debriefing
- Long Range Recon, Special Forces
    - LRSU, SOF collectors explicitly tasked to
      go to location, observe, and report
    - Information collected depends on line of sight to
      enemy units
- Source Operations
    - Agents recruit, debrief sources, report
    - Information depends on units near source,
      source characteristics
    - Information is randomized
    - Sources may be unreliable, respond

Model Overview

CI/Humint Setup

II-B Scenario Builder

Source Creation Tool

II-A

II-B

CI/Humint Data

Scenario XML

Observables

Virtual Humans

CI/Humint Model

Activity Model

Source/Agent Model

Tasking (TACIT)

Plugins

Date

Combat

Weather

Visualization

Activities

Map

TACSIM / Outside World

TACSIM / BattleSpace

Signal Generators

-signals at particular times, locations

-Battle space(TACSIM)
    --Units, locations, strength

-**Human scenario space**
    --Activities in a terrorist plot
    -- Demonstration
    --Police, FBI, news reports
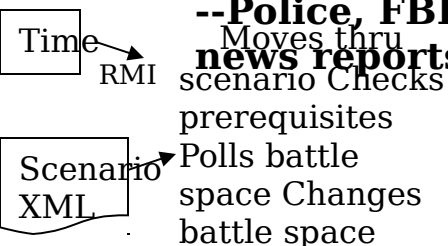
Human Sensor
- **Operating characteristics**
    -Location, mobility
    -State(asleep, awake)
- **Noise parameters**
    -Knowledge
    -Accuracy
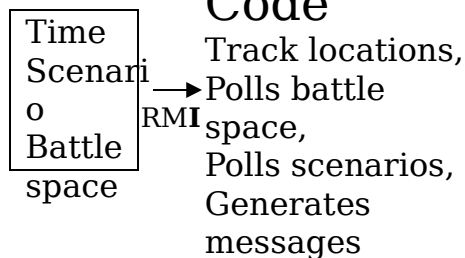
"saw three tanks going West on Three Tanks Trail this morning"

"meeting at Joe's Grill … blow up bridge…"

FM JIC 511 …//CCJ2//

TO DIA WASHINGTON DC

SERIAL: (U) IIR 2 229 0089 O2.

SOURCE: (U) //2 229 0024//A 58 YEAR OLD LA-QUIDA …

TEXT: 1.(U) …

Transmission to TACSIM
- Two steps by trainee
- Consumes time
- Requires
    --Co-location
    --Human awake
- SALUTE format

Code

| Time | → RMI | Moves thru scenario Checks prerequisites Polls battle space Changes battle space |

| Scenario XML | | |

Code

| Time Scenario Battle space | → RMI | Track locations, Polls battle space, Polls scenarios, Generates messages |

Code
Web based tasking interface

Activities

- Activity
    - a group of related events occurring near the same place and time

- Scenarios consist of Activities that:
    - Are logically ordered by predecessor and successor activities
    - Have true information ("Observables"), some of which may be transferred
    - Modify behavior conditionally depending on the state of other models
      (e.g. TACSIM, BattleSpace)
    - Modify future Activities depending on the state of the Scenario

- Graph structured vs. Tree structured

- The impact of our modeling approach
    - Realistic branching
    - Realistic cause-and-effect modeling

Activity
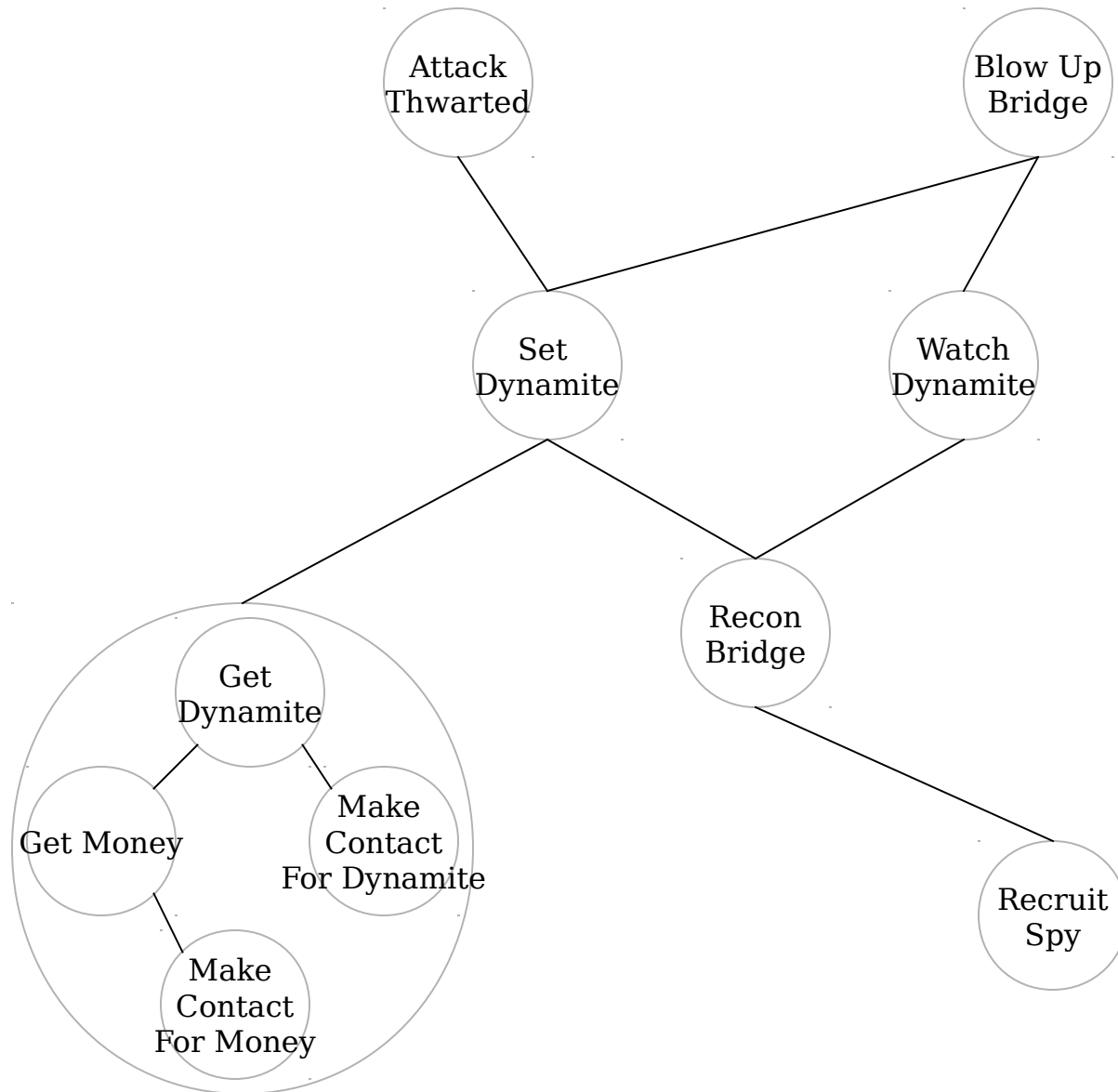
Information Transfer

- Goal – increased fidelity of information transferred from the observables in an activity to sources
- Information transferred depends on
  - Proximity of source to activity
  - Source's knowledge of objects comprising the activity
  - Source's ability to act autonomously
- Source properties
  - Knowledge in various job categories
  - Affiliations with various organizations
- Observables have relevancies to and affiliations with the same job categories and organizations
- Knowledge effectiveness (*Ke*)
  - Combine source's knowledge factors with object's relevancies
  - $Ke = 1 - \prod(1 - K_c \cdot R_c)$, product is over *c* in job categories
    - K_c is source's knowledge in job category *c*
    - R_c is object's relevance to job category *c*
- Each activity has information tagged by proximity and knowledge effectiveness necessary for a source to receive the information
- Ability to act autonomously combines source's affiliations with activity's affiliations

Example

```
<observable id='RedVolvo'>
          <relevance to='law' is='.90'/>
          <relevance to='agr' is='.60'/>
          <relevance to='mil' is='.70'/>


          <observation ke='0.75' pe='5.0' ae='0.0'>
                    A 1984 red volvo wagon with 2 male passengers,
roof rack
                    <RANDOM>
                              <R>Nearly bald front tires</R>
                              <R> Bad tires </R>
                    </RANDOM>
                    License Arizona 789-DOG, front plate CUINAZ
                    Runs on 3 cylinders, burns 1l oil/1000km, weak
battery
          <observation/>
          …
          <observation ke='0.0' pe='100' ae='0.0'>
                    A red car
          </observation>
```

Source Background State

- Increased realism of sources.
- Sources move autonomously
  - Sleep
  - Loiter – able to observe, but stationary
  - Wander – random motion, constrained by space/time endpoints and speed
  - Travel – linear motion, constrained by space/time endpoints and speed
- Result – we can now simulate (for example) a source sleeping(from 2200 to 0600), eating breakfast (0600 to 0630), wandering about his farm (0630 to 1200), …,wandering from his farm to town (1700 to 1800), loitering in a tavern (1800 to 2130), traveling to home (2130 to 2200), on a daily basis.

Multiple Scenarios

- CiHumint model able to run multiple independent scenarios
  - Can be individually paused and (re)started
  - Can dynamically add scenarios

Scenarios

- Toy Scenario – Blow Up Bridge
  - 20 Activities
  - Watches battle space
  - Affects battle space
- San Francisco Bay Area Terrorism Scenario
  - more than 200 activities
  - In text form (reports from FBI, CIA, police, TV, etc.)
  - Adapted to CiHumint Model format with Scenario Builder

Visualization
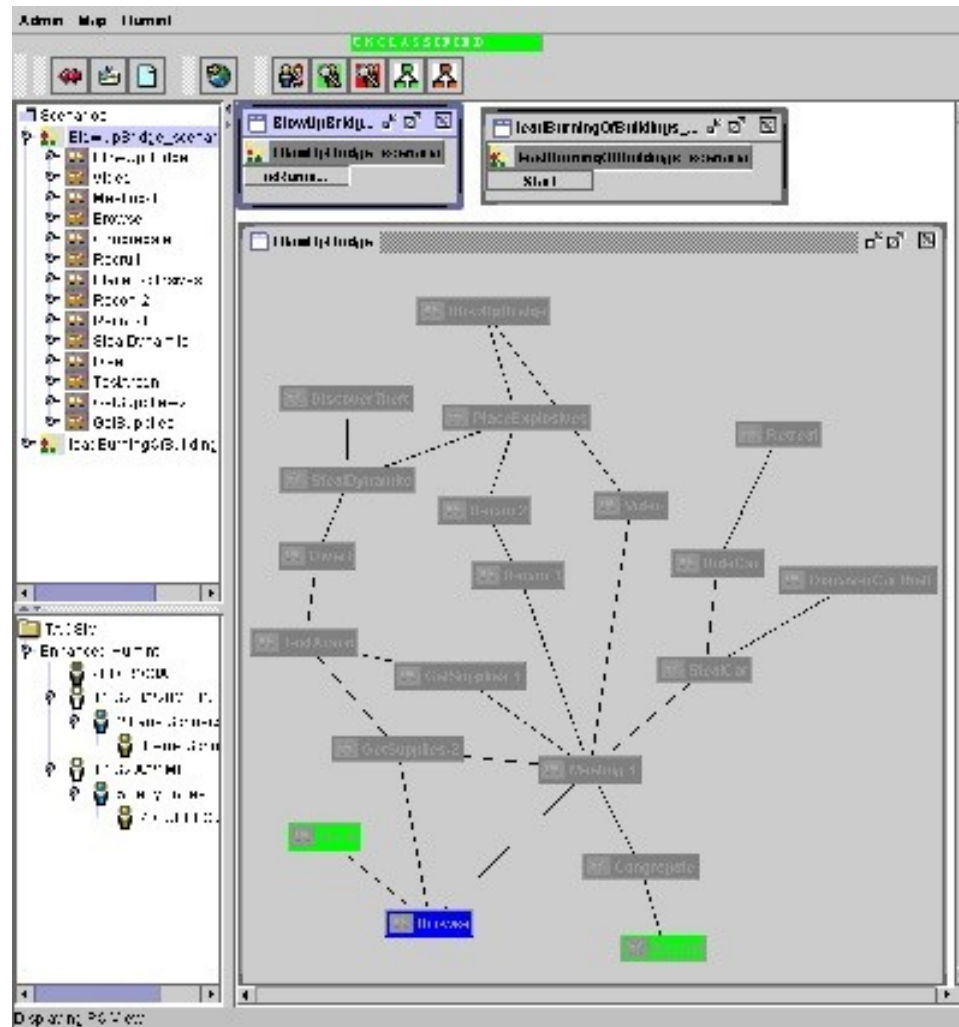
Tasking

File   Edit   View   Go   Communicator   Help

Back   Forward   Reload   Home   Search   Netscape   Print   Security   Shop   Stop

Bookmarks   Location: http://bear:8080/tasking/viewagent.jsp?aid=2   What's Related

WebMail   Calendar   Radio   People   Yellow Pages   Download   Channels   Sun   Netscape Netcenter

UNCLASSIFIED

COLLECTOR   last update
                                                                        07:43 25JUN2003

Larry Schneider   Last Reported Location: about 4km east of Saemjae [vic 52S CG430553]
B/220MI.BN   Cash On Hand: $870

| Collector List | View Collector | Task Collector |

CURRENT TASKS

H	M	L	DTG Submitted	Task	Status	Remove
⦿	(	(	06:30 25JUN2003	Report to higher headquarters.	Success	☐
(	(	⦿	15:18 24JUN2003	Debrief Amy Schneider (near Kokkyo–ri [vic 52S CG350556]). Also, offer $100 payment to Amy Schneider for services.	Success	☐
(	(	⦿	15:18 24JUN2003	Debrief Anthony Bat (about 4km east of Saemjae [vic 52S CG430553]). Also, offer $30 payment to Anthony Bat for services.	Success	☐

Update Tasks

SPECIFIC INFORMATION REQUIREMENTS (SIR)

| Specific Unit Types	Specific Equipment Types
NO SPECIFIC UNITS AIR DEFENSE ARTILLERY	NO SPECIFIC EQUIPMENT ANTI-AIRCRAFT ARTILLERY PIECES

Message in Tacsim (MAFS)

Scenario Builder

- Simple, intuitive interface
- Validates user inputs
- Modular design of scenarios – parts of one scenario may be used in another
- Map based entry of locations
- Features
  - Help menu
  - Integral documentation
  - Location list
  - Create sources and agents

Scenario Builder
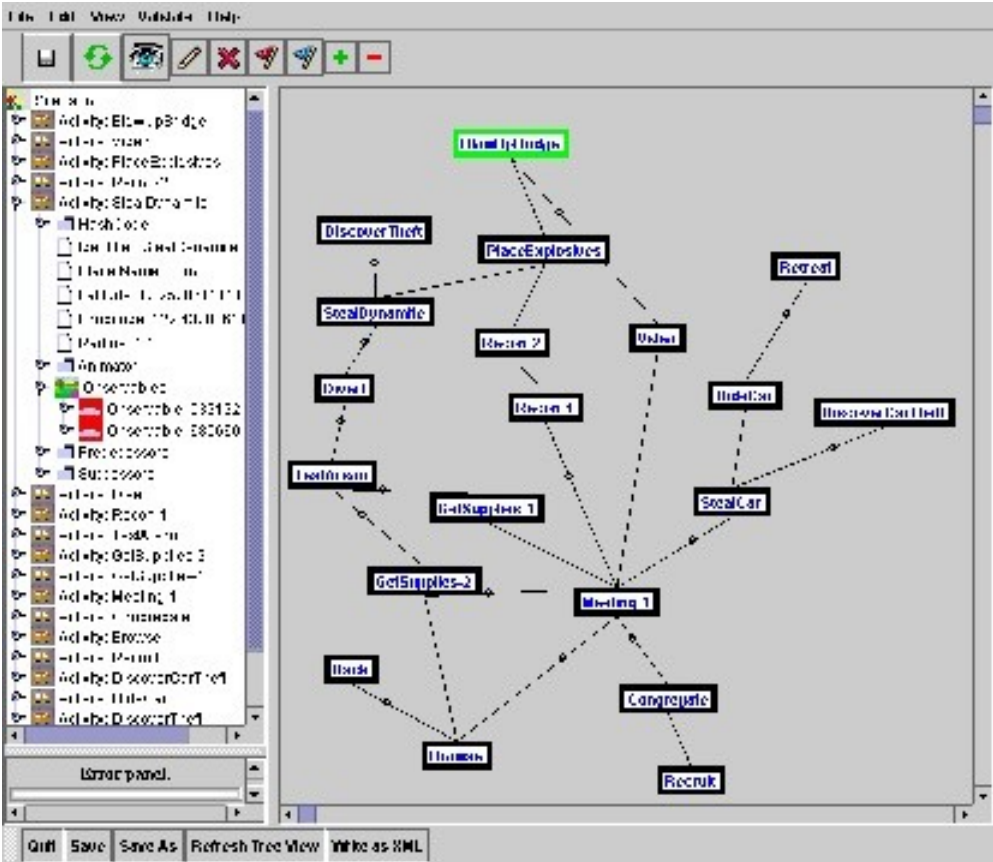
Future Plans/Ideas

- Allow interaction between sources and Scenarios

- Add browser based visualization

- Modify Scenarios during the course of an exercise

- Add plugins for other models
  - Static environment (JMTK mobility, terrain)
  - Dynamic environment(weather, sun/moon)

DISCUSSION

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